5 year Higher Scheme of Work

This 5-Year Higher Scheme of Work offers a flexible approach for Year 7 to Year 11. It is based on a minimum of seven one hour Maths lessons per fortnight (assuming a two week timetable of three lessons in one week and four in the second). This accounts for an average of 140 teaching hours per academic year, with the exception of Year 11, which has 115 due to GCSE examinations in summer (2). In addition to this, there are assessment and review sessions built in.

		Week	Book / Chapter: Topic	Topic break-down (sub-topics)	Total no. of teaching hours	Learning Objectives
			Maths Frameworking Pupil Book 1.1			
Year 7	Term 1	1/2	1: Using numbers	1.1 Charts and financial mathematics	7	• To carry out calculations from information given in charts and tables • To know and use financial vocabulary
				1.2 Positive and negative numbers		• To order positive and negative numbers using a number line • To use and apply comparison symbols such as > (greater than) and < (less than)
				1.3 Simple arithmetics with negative numbers 1.4 Subtracting negative numbers 1.5 Multiplying negative numbers		• To calculate addition, subtraction and multiplication problems involving directed numbers
				Travelling in Asia and Eastern Europe		• To use and apply directed number calculations in a real-life situation
		3/4	2: Sequences	2.1 Function machines	5	• To use function machines to generate inputs and outputs • To use given inputs and outputs to work out a function
				2.2 Sequences and rules		• To recognise, describe and generate linear sequences
				2.3 Finding missing terms		• To identify missing terms in a sequence

				2.4 Working out the *n*th term		• To identify the *n*th term of a linear sequence • To use the *n*th term to work out any term in a sequence
		3/4	2: Problem solving and reasoning	2.5 Other sequences	2	• To explore square and triangular numbers as sequences • To know and generate the Fibonacci sequence and Pascal's triangle
				Valencia Planetarium		• To apply knowledge of sequences in a context
		5	3: Perimeter, area and volume	3.1 Perimeter and area of rectangles	4	• To use a simple formula to work out the perimeter of a rectangle • To use a simple formula to work out the area of a rectangle
				3.2 Perimeter and area of compound shapes		• To work out the perimeter and area of compound rectilinear shapes by using simple formulae
				3.3 Area of common 2D shapes		• To calculate the area of a triangle. • To calculate the area of a parallelogram • To calculate the area of a trapezium
		6	3: Perimeter, area and volume	3.4 Surface area and volume of cubes and cuboids	3	• To calculate the surface area of cubes and cuboids • To calculate the volume of cubes and cuboids
		6	3: Problem solving	Design a bedroom	1	• To calculate perimeters and areas in a real-life context
			Half term assessment		1	
		HALF TERM				
		7	4: Decimal numbers	4.1 Multiplying and dividing by 10,100,1000 and 10 000	7	• To multiply and divide decimal numbers by powers of 10
				4.3 Esimates		• To use rounding to estimate answers to calcuations, to spot possible errors
				4.2 Ordering decimals		• To order decimals, including numbers with different decimal places

				4.4 Adding and subtracting decimals 4.5 Multiplying decimals 4.6 Dividing decimals		• To add and subtract decimal numbers • To multiply and divide decimal numbers
				Financial skills – Shopping for leisure		• To solve multi-step problems involving decimals in a familiar context
		8/9/10	5: Working with numbers	5.1 Square numbers and square roots	10	• To recognise and use square numbers up to 225 (15^2) and corresponding square roots
				5.2 Rounding		• To round numbers to more than one decimal place • To round numbers to one or two significant figures
				5.3 Order of operations		• To use the conventions of BIDMAS to carry out calculations
				5.4 multiplications problems without a calculator		• To use an efficient written method of multiplication without a calculator
				5.5 Division problems without a calculator		• To use an efficient written method of division without a calculator
				5.6 Calculations with measurements		• To convert between common metric units • To use measurements in calculations • To recognise and use appropriate metric units
		10	5: Problem solving and reasoning	What is your carbon footprint?	2	• To apply number skills in real life contexts
		11/12	6: Statistics	6.1 Mode, median and range	7	• To calculate and use the mode, median and range of a set of data
				6.2 The mean		• To calculate and use the mean average of a set of data
				6.3 Statistical diagrams		• To be able to read and interpret different statistical diagrams
				6.4 Collecting and using discrete data		• To create and use a tally chart
				6.5 Collecting and using continuous data		• To understand continuous data and use grouped frequency

				6.6 Data collection		• To develop a greater understanding of data collection
				Challenge – School sports day		• To apply data handling skills to a real-life situation
		13	End of term assessment		1	
		13	*Assessment review*		1	
		CHRISTMAS HOLIDAY				
	Term 2	1/2	7: Using algebra	7.1 Expressions and substitution	6	• To use algebra to write simple expressions and recognise equivalent expressions • To substitute numbers into expressions to work out their value
				7.2 Simplifying expressions		• To apply arithmetic rules to algebraic expressions
				7.3 Using formulae		• To use substitution in the context of formulae
				7.4 Writing formulae		• To construct formulae from contextual situations
		2	7: Problem solving and reasoning	Winter sports	1	• To use a formula to calculate costs
		3/4	8: Fractions	8.1 Equivalent fractions	7	• To find common equivalent fractions • To write fractions in their simplest form
				8.2 Comparing fractions		• To compare and order two fractions
				8.3 Adding and subtracting fractions		• To add and subtract fractions with different denominators
				8.4 Mixed numbers and improper fractions 8.5 Calculations with mixed numbers		• To convert between mixed numbers and improper fractions • To add and subtract simple mixed numbers with different denominators
		4	8: Challenge	Fractional dissection	1	• To explore fractions in the context of the part-whole relationship
		5/6	9: Angles	9.1 Measuring and drawing angles	5	• To use a protractor to measure an angle • To use a protractor to draw an angle

				9.2 Calculating angles		• To know the properties of parallel and perpendicular lines • To calculate angles on a line • To calculate angles at a point • To identify opposite equal angles
				9.3 Corresponding and alternate angles		• To calculate angles in parallel lines
				9.4 Angles in a triangle		• To know that the angle sum in a triangle is 180°
				9.5 Angles in a quadrilateral		• To know that the angle sum in a quadrilateral is 360°
				9.6 Properties of triangles and quadrilaterals		• To know and use the properties of triangles • To know and use the properties of quadrilaterals
		6	9: Activity	Constructing triangles	1	• To use angles construction and measuring skills with confidence, fluency and accuracy
			Half term assessment		1	
		HALF TERM				
		7/8	10: Coordinates and graphs	10.1 Coordinates in four quadrants	7	• To use coordinates to identify and locate position points in all four quadrants
				10.2 Graphs from relationships 10.3 Predicting graphs from relationships		• To draw a graph using a simple linear rule • To know the connection between pairs of coordinates and the relationship shown in an equation and a graph
				10.4 Graphs of fixed values of x and y, $y = x$ and $y = -x$		• To recognise and draw linear graphs with values of x and y • To recognise and draw the graphs of $y = x$ and $y = -x$
				10.5 Graphs of the form $x + y = a$		• To recognise and draw graphs of the form $x + y = a$
				10.6 Graphs from the real world		• To draw and use real-life graphs • To know how graphs can be used in real-life situations

		8	10: Challenge	Global Warming	1	• To apply graphing skills in a real-life situation
		9/10	11: Percentages	11.1 Fractions, decimals and percentages	5	• To know equivalences between common fractions, decimals and percentages • To understand and use percentages greater than 100%
				11.2 Fractions of a quantity		• To calculate a fraction of a quantity without a calculator
				11.3 Calculating simple percentages		• To calculate a percentage of a quantity without a calculator
				11.4 Percentages with a calculator		• To calculate a percentage of a quantity with a calculator • To know when it is appropriate to use a calculator
				11.5 Percentage increase and decrease		• To calculate the result of a percentage change
				Financial skills – Income tax		• To work out the result of a simple percentage change • To apply percentage skills in a real-life context
		11/12	12: Probability	12.1 Probability scales	3	• To know the vocabulary of probability • To know and use the 0–1 probability scale
				12.2 Combined events		• To use sample space diagrams to work out the probability of a combined event
				12.3 Experimental probability		• To know the difference between theoretical and experimental probability • To calculate and use experimental probability
				Financial skills – Easter Fayre		• To use experimental and theoretical probability in a real-life context
		12	*Revision*		1	
			End of term assessment		1	
		EASTER HOLIDAY				

	Term 3	1/2	13: Symmetry	13.1 Line symmetry and rotational symmetry	4	• To recognise shapes that have reflective symmetry • To draw lines of symmetry on a shape • To recognise shapes that have rotational symmetry • To find the order of rotational symmetry for a shape
				13.2 Reflections		• To be able to reflect a shape in vertical and horizontal mirror lines • To use a coordinate grid to reflect shapes in lines, including $y = x$
				13.3 Rotations		• To be able to rotate a shape
				13.4 Tessellations		• To be able to tessellate shapes
		2	13: Activity	Landmark spotting	1	• To apply aspects of symmetry in real-life contexts
		2/3	14: Equations	14.1 Finding unknown numbers	6	• To find missing numbers in simple calculations
				14.2 Solving equations		• To solve equations involving one operation
				14.3 Solving more complex equations		• To solve equations involving two operations
				14.4 Setting up and solving equations		• To use algebra to set up and solve equations
				Challenge – number puzzles		• To identify and solve multi-step linear equations
		4/5	15: Interpreting data	15.1 Pie charts	6	• To read and interpret data from pie charts • To use a scaling method to draw a pie chart
				15.2 Comparing data using averages and the range		• To use the averages and range to compare and interpret data sets
				15.3 Statistical surveys		• To carry out a statistical survey • To use charts and diagrams to interpret data and write a report
				Challenge – Dancing competition		• To apply data interpretation skills in everyday situations

			Half term assessment		1	
			HALF TERM			
		6/7	16: 3D shapes	16.1 Naming and drawing 3D shapes	5	• To know the names and properties of common 3D shapes • To use isometric paper to represent shapes made from cubes
				16.2 Using nets to construct 3D shapes		• To draw nets for 3D shapes • To construct 3D shapes from nets, including more complex shapes
				16.3 3D investigations		• To establish the rule connecting faces, edges and vertices in 3D shapes (Euler)
		7	16: Problem solving and reasoning	Delivering packages	1	• To solve 3D shape problems in everyday situations
		8/9	17: Ratio	17.1 Introduction to ratios	5	• To know ratio notation • To use ratios to compare quantities
				17.2 Simplifying ratios		• To write a ratio in its simplest terms • To write ratios in the form 1 : x
				17.3 Ratios and sharing		• To use ratios to find totals and missing quantities • To write ratios to compare more than two items
				17.4 Ratios and fractions		• To use and apply the connection between ratios and fractions as a proportionality relationship
		9	17: Problem solving and reasoning	Smoothie bar	1	• To use ratios in a real-life context.
		10	End of term assessment		2	
		11	*Assessment review*		2	
		END OF YEAR 7 / SUMMER HOLIDAY				

Year 8	Term 1		Maths Frameworking Pupil Book 1.2			
		1/2	1: Working with numbers	1.1 Multiplying and dividing directed numbers	7	• To carry out multiplications and divisions involving negative numbers
				1.2 Factors and HCF		• To know and use highest common factors
				1.3 Multiples and LCM		• To know and use lowest common multiples
				1.4 Powers and roots		• To know and use powers and roots
				1.5 Prime factors		• To be able to identify the prime factors of any integer
				Challenge – Blackpool Tower		• To be able to use and apply number skills in a real-life situation
		3/4	2: Geometry	2.1 Parallel lines	7	• To calculate angles in parallel lines
				2.2 Geometric properties of quadrilaterals		• To know the geometric properties of quadrilaterals
				2.3 Translations		• To be able to translate a shape
				2.4 Enlargements		• To enlarge a 2D shape by a scale factor
				2.5 Constructions		• To construct the mid-point and perpendicular bisector of a line • To construct a perpendicular to a line from or at a given point
				Challenge – Constructions		• To complete more complex constructions and produce a set of instructions
		5/6	3: Probability	3.1 Mutually exclusive outcomes and exhaustive outcomes	7	• To recognise mutually exclusive outcomes and exhaustive outcomes • To represent a chance on a probability scale
				3.2 Using a sample space to calculate probabilities		• To use a sample space to calculate probabilities
				3.3 Estimates of probability		• To use relative frequency to estimate probabilities
				Financial skills – Fun in the Fairground		• To apply probability to a real-lifee situation

			Half term assessment		1	
			HALF TERM			
		7/8	4: Percentages	4.1 Calculating percentages	7	• To write one quantity as a percentage of another
				4.2 Calculating percentage increase and decrease		• To use a multiplier to calculate a percentage change
				4.3 Calculating a percentage change		• To work out a change in value as a percentage increase or decrease
				Challenge – Changes in population		• To apply percentages when analysing a real-life situation
		9/10	5: Congruent Shapes	5.1 Congruent shapes	7	• To recognise congruent shapes
				5.2 Congruent triangles		• To know the conditions for recognising congruent triangles
				5.3 Using congruent triangles to solve problems		• To solve geometric problems using the rules of congruency
				Problem solving – Using scale diagrams to work out distances		• Applying scale factors in real-life situations
		11/12	6: Surface area and volume of prisms	6.1 Metric units for area and volume	6	• To convert between metric units for area and for volume
				6.2 Surface area of prisms		• To calculate the surface area of a prism
				6.3 Volume of prisms		• To calculate the volume of a prism
				Investigation – A cube investigation		• To apply knowledge of area and work systematically to solve a problem
			End of term assessment		1	
			Assessment review		1	
			CHRISTMAS HOLIDAY			
	Term 2	1/2	7: Graphs	7.1 Graphs from linear equations	6	• To develop graphical fluency with a range of linear representations
				7.2 Gradient of a line		• To know the gradient of a line from its linear equation • To establish the equation of a line in the form $y = mx + c$ from its graph

				7.3 Graphs from quadratic equations		• To recognise and draw the graph from a quadratic equation • To solve a quadratic equation from a graph
				7.4 Real-life graphs		• To draw graphs from real-life situations to show the relationship between two variables
				Challenge – The M25		• To solve problems involving more than one variable in a real-life context
		3/4	8: Number	8.1 Powers of 10	7	• To multiply and divide by negative powers of 10
				8.2 Significant figures		• To round to a specific number of significant figures
				8.3 Standard form with large numbers		• To write a large number in standard form
				8.4 Multiplying with numbers in standard form		• To multiply with numbers in standard form
				Challenge – Space – to see where no-one has seen before		• To apply standard form to solve a problem in a real-life context
		5/6	9: Interpreting data	9.1 Interpreting graphs and diagrams	7	• To interpret different charts seen in the media
				9.2 Relative sized pie charts		• To draw pie charts relative to data size
				9.3 Scatter graphs and correlation		• To read scatter graphs • To interpret correlation
				9.4 Creating scatter graphs		• To construct scatter graphs and use a line of best fit to describe data trends
				Challenge – Football attendances		• To use and apply data handling skills in a real-life context
			Half term assessment		1	
		HALF TERM				
		7/8/9	10: Algebra	10.1 Algebraic notation	10	• To simplify algebraic expressions involving the four operations of arithmetic
				10.2 Like terms		• To simplify expressions by collecting up like terms

				10.3 Expanding brackets		• To multiply out brackets in an expression
				10.4 Using algebraic expressions		• To identify and manipulate algebraic expressions
				10.5 Using index notation		• To write algebraic expressions involving powers
				Mathematical reasoning – Writing in algebra		• To use and apply algebraic manipulation skills in a range of contexts
		10/11	11: Shape and ratio	11.1 Ratio of lengths, areas and volumes	8	• To use ratio to compare lengths, areas and volumes of 2D and 3D shapes
				11.2 Fractional enlargement		• To enlarge a 2D shape by a fractional scale factor
				11.3 Map scales		• To be able to read and use map scales efficiently
				Activity – Map reading		• To use and apply skills and knowledge of area, ratio and data handling in a real-life context.
			Revision		1	
			End of term assessment		1	
			Assessment review		1	
	Term 3	EASTER HOLIDAY				
		1/2/3	12: Fractions and decimals	12.1 Adding and subtracting fractions	10	• To add and subtract fractions and mixed numbers
				12.2 Multiplying fractions and integers		• To multiply a fraction or a mixed number and an integer
				12.3 Dividing with fractions and integers		• To divide a fraction or a mixed number by an integer • To divide an integer or a mixed number by a fraction
				12.4 Multiplication with large and small numbers		• To multiply with combinations of large and small numbers mentally
				12.5 Division with large and small numbers		• To divide combinations of large and small numbers mentally
				Challenge – Guesstimates		• To use mental calculation strategies and estimation in real-life situations

		4	13: Proportion	13.1 Direct proportion	4	• To know what is meant by direct proportion • To find missing values in problems involving proportion
				13.2 Graphs and direct proportion		• To represent direct proportion graphically and algebraically
				13.3 Inverse proportion		• To know what is meant by inverse proportion • To use graphical and algebraic representations of inverse proportion
				13.4 Comparing direct proportion and inverse proportion		• To recognise direct and inverse proportion and work out missing values
				Challenge – Planning a trip		• To apply knowledge of proportion to a real-life situation
		5/6	14: Circles	14.1 The circumference of a circle	5	• To know the definition of a circle and be able to name the parts of a circle • To establish the relationship between the circumference and diameter of a circle (π)
				14.2 Formula for the circumference of a circle		• To calculate the circumference of a circle
				14.3 Formula for the area of a circle		• To calculate the area of a circle
				Financial skills – Athletics stadium		• To use and apply knowledge of number and circles to solve multi-step problems in real-life contexts
			Half term assessment		1	
		HALF TERM				
		7/8	15: Equations and formulae	15.1 Equations with brackets	7	• To solve equations involving brackets • To solve equations where the answers are fractions or negative numbers
				15.2 Equations with the variable on both sides		• To solve equations with the variable on both sides
				15.3 More complex equations		• To solve equations with fractions and fractional coefficients • To solve simple equations involving squares

				15.4 Rearranging formulae		• To change the subject of a formula, including formulae involving squares
				Mathematical reasoning – Using graphs to solve equations		• Be able to make links between graphical and algebraic representations to solve equations
		9/10	16: Comparing Data	16.1 Grouped frequency tables	7	• To create a grouped frequency table from raw data
				16.2 Drawing frequency diagrams		• To interpret frequency diagrams • To draw a frequency diagram from a grouped frequency table
				16.3 Comparing sets of data		• To be able to compare data from two sources
				16.4 Misleading charts		• To recognise when a statistical chart may be misleading
				Problem solving – Why do we use so many devices to watch TV?		• Be able to interpret and present data in order to make valid comparisons
		11	End of term assessment		1	
		11	*Assessment review*		1	
END OF YEAR 8 / SUMMER HOLIDAY						
Year 9	Term 1		Maths Frameworking Pupil Book 1.3			
		1/2	1: Percentages	1.1 Simple interest	7	• To know what is meant by simple interest • To solve problems involving simple interest
				1.2 Percentage increase and decrease		• To use the multiplier method to calculate the result of a percentage increase or decrease • To calculate the percentage change in a value
				1.3 Calculating the original value		• To calculate the original value, given a percentage change
				1.4 Repeated percentage changes		• To calculate the result of repeated percentage changes

				Challenge – Exponential growth		• Be able to use and apply prior knowledge to extend learning and make links with other areas of mathematics
		3/4/5	2: Equations and formulae	2.1 Multiplying out brackets	10	• To expand brackets and simplify more complex expressions
				2.2 Factorising algebraic expressions		• To factorise more complex expressions
				2.3 Expressions with several variables		• To expand and factorise expressions with more than one variable
				2.4 Equations with fractions		• To solve equations where the variable is in the denminator of a fraction
				Investigation – Body mass index		• To use and apply skills to solve problems in a real-life context
		5/6	3: Polygons	3.1 Properties of polygons	5	• To work out the sum of the interior angles of a polygon • To work out the exterior angles of polygons
				3.2 Interior and exterior angles of regular polygons		• To calculate the interior and exterior angles of regular polygons
				3.3 Tessellations and regular polygons		• To establish which regular polygons tessellate
				Mathematical reasoning – Semi-regular tessellations		• To use geometric reasoning and apply prior knowledge to extend learning
			Half term assessment		1	
			HALF TERM			
		7/8	4: Using data	4.1 Scatter graphs and correlation	7	• To infer a correlation from two related scatter graphs • To draw a line of best fit to show a correlation
				4.2 Two-way tables		• To interpret a variety of two-way tables
				4.3 Estimation of a mean from grouped data		• To estimate a mean from grouped data

				4.4 Cumulative frequency diagrams		• To draw a cumulative frequency diagram • To find the interquartile range
				4.5 Statistical investigations		• To plan a statistical investigation
				Challenge – Census		• Use and apply statistical skills and analysis to a real-life situation
		9/10	5: Applications of graphs	5.1 Step graphs	7	• To interpret step graphs
				5.2 Time graphs		• To interpret and draw time graphs
				5.3 Exponential growth graphs		• To draw exponential growth graphs
				Problem solving – Mobile phone tariffs		• To use and apply knowledge of graphs to solve best buy problems in real-life contexts
		11/12	6: Pythagoras' Theorem	6.1 Introducing Pythagoras	7	• To use Pythagoras' theorem to calculate missing sides in right- angled triangles
				6.2 Using Pythagoras' theorem to solve problems		• To use Pythagoras' theorem to solve problems in context
				6.3 The converse of Pythagoras' theorem		• To use the converse of Pythagoras' theorem to establish whether or not a triangle is a right-angled triangle
				Activity – Practical Pythagoras		• To apply Pythagoras' theorem in a practical context
			End of term assessment		1	
			Assessment review		1	
		CHRISTMAS HOLIDAY				
	Term 2	1/2	7: Fractions	7.1 Adding and subtracting fractions	5	• To choose an appropriate method to add or subtract mixed numbers
				7.2 Multiplying fractions and mixed numbers		• To multiply two fractions or mixed numbers
				7.3 Dividing fractions and mixed numbers		• To divide one fraction or mixed number by another fraction or mixed number

				7.4 Algebraic fractions		• To add, subtract, multiply or divide fractions containing a variable
				Investigations – Fractions from one to six		• To apply knowledge of fractions to a more complex problem • To work systematically
		2/3	8: Algebra	8.1 Expanding the product of two brackets	6	• To multiply out (or expand) two brackets
				8.2 Expanding expressions with more than two brackets		• To multiply out three or more brackets
				8.3 Factorising quadratic expressions with positive coefficients		• To factorise quadratic expressions with positive coefficients
				8.4 Factorising quadratic expressions with negative coefficients		• To factorise quadratic expressions with negative coefficients
				8.5 The difference of two squares		• To recognise and use the difference of two squares to solve an equation
				Challenge – Graphs from expressions		• To use and apply knowledge of factorising and expansion in a practical context
		4/5	9: Decimal numbers	9.1 Powers of 10	7	• To calculate with positive and negative powers of 10
				9.2 Standard form		• To calculate using standard form for positive and negative powers of 10
				9.3 Multiplying numbers in standard form		• To multiply numbers in standard form
				9.4 Dividing with numbers in standard form		• To divide numbers in standard form
				9.5 Upper and lower bounds		• To use limits of accuracy when rounding data
				Mathematical reasoning – To the stars and back		• To use and apply skills and knowledge of standard form in a real-life context
			Half term assessment		1	

			HALF TERM			
		6/7	10: Surface area and volume of cylinders	10.1 Volume of a cylinder	7	• To calculate the volume of a cylinder
				10.2 Surface area of a cylinder		• To calculate the curved surface area of a cylinder • To calculate the total surface area of a closed cylinder
				10.3 Composite shapes		• To calculate the volumes and surface areas of composite shapes
				Problem solving – Packaging soup		• To use and apply knowledge of volume and surface area to solve a practical problem
		8/9/10	11: Solving equations graphically	11.1 Graphs from equations of the form $ay \pm bx = c$	10	• To draw any linear graph from its equation • To solve a linear equation graphically
				11.2 Solving simultaneous equations by drawing graphs		• To solve a pair of simultaneous equations graphically
				11.3 Solving quadratic equations by drawing graphs		• To solve quadratic equations graphically
				11.4 Solving cubic equations by drawing graphs		• To solve cubic equations graphically
				Challenge – Maximum packages		• To use and apply knowledge of functions to solve a real-life problem graphically
		10	End of term assessment		1	
		10	*Assessment review*		1	
		EASTER HOLIDAY				
	Term 3	1/2	12: Compound units	12.1 Speed	7	• To solve distance/time/speed problems
				12.2 More compound units		• To solve problems involving density/mass/volume
				12.3 Unit costs		• To apply the unit cost method to solve problems such as best value

				Challenge – Population density		• To use and apply knowledge of compound measure strategies to a problem in a practical context
		3/4	13: Right-angled triangles	13.1 Introduction to trigonometric ratios	7	• To know what trigonometric ratios are
				13.2 How to find trigonometric ratios of angles		• To know how to find the trigonometric ratios of sine, cosine and tangent in a right-angled triangle
				13.3 Using trigonometric ratios to find angles		• To find the angle identified from a trigonometric ratio
				13.4 Using trigonometric ratios to find lengths		• To find an unknown length of a right-angled triangle given one side and an angle
				Investigation – Barnes Wallis and the bouncing bomb		• To use and apply trigonometry in a practical context
			Note: the final references for Year 9 are intended as introductions only for those students who are ready for it.			
			AQA GCSE Higher Student Book			
		5/6	1.4 Introduction to algebraic proof	4.1 Reasoning about number patterns	7	• Make and test conjectures about patterns and relationships • Look for proofs and counter-examples
			Half term assessment		1	
			HALF TERM			
		7	12: Introduction to geometric proof	12.1 Properties and relationships	3	• Use known geometric results to obtain simple proofs
		8	13: Probability	13.2 Independent and combined events	4	• To calculate the probability of independent and combined events using a tree diagram

		9	4: Introduction to geometric Sequences	4.4 Generating non-linear sequences	3	• To generate and identify non-linear sequences from either a term-to term or a postion-to-term rule
		10	*Revision*		6	
			End of term assessment		1	
			Assessment review		1	
		END OF YEAR 9 / SUMMER HOLIDAY				
Year 10	Term 1		AQA GCSE Higher Student Book			
		1 /2	1 Number: Basic number	1.1 Solving real-life problems	7	• To solve number problems in a real-life context
				1.2 Multiplication and division of decimals		• To multiply a decimal number by another decimal number • To divide by decimals by adjusting the calculation to division by an integer
				1.3 Approximation of calculations		• To round to a given number of significant figures in order to approximate a result before calculating • To round a calculation at the end of the problem to give a reasonable answer
				1.4 Multiples, factors, prime numbers, powers and roots		• To generate factors and multiples for any given integer • To identify prime numbers to 100 • To identify square and cube numbers and their roots to 100 • To identify and generate triangular numbers
				1.5 Prime factors, LCM and HCF		• To identify prime factors for any given integer • To identify the LCM of two integers • To identify the HCF of two integers

				1.6 Negative numbers		• To multiply and divide by directed numbers
		3 /4	2 Number: Fractions, ratio and proportion	2.1 One quantity as a fraction of another	7	• To find one fraction as a quantity of another
				2.2 Adding, subtracting and calculating with fractions		• To add and subtract fractions with different denominators
				2.3 Multiplying and dividing fractions		• To multiply by proper and improper fractions • To divide by a fraction
				2.4 Fractions on a calculator		• To use the fraction button on a calculator to carry out calculations
				2.5 Increasing and decreasing quantities by a percentage		• To increase and decrease quantities by a percentage
				2.6 Expressing one quantity as a percentage of another		• To express one quantity as a percentage of another • To work out percentage change
		5/6	3 Statistics: Statistical diagrams and averages	3.1 Statistical representation	7	• To present, analyse and interpret discrete and continuous sets of data
				3.2 Statistical measures		• To calculate the mean, median and mode of a set of data • To choose the most appropriate average to use • To calculate and interpret the range of a set of data
				3.3 Scatter diagrams		• To draw, interpret and use scatter diagrams • To identify correlation and draw a line of best fit • To estimate missing values in a scatter diagram
			End of term assessment		1	

			HALF TERM			
		7/8	4 Algebra: Number and sequences	4.1 Patterns in number	7	• To extend and identify number patterns
				4.2 Number sequences		• To identify simple linear rules • To generate sequences, given the rule
				4.3 Finding the *n*th term of a linear sequence		• To generalise and find the *n*th term of a linear sequence
				4.4 Special sequences		• To recognise and continue some special number sequences such as square numbers or a simple geometric progression
				4.5 General rules from given patterns		• To find the *n*th term from a sequence of patterns
				4.6 The *n*th term of a quadratic sequence		• To continue a quadratic sequence, given the rule
				4.7 Finding the *n*th term for quadratic sequences		• To find the *n*th term of a quadratic sequence from second differences
		9/10	5 Ration, proportion and rates of change: Ratio and proportion	5.1 Ratio	7	• To simplfy a given ratio • To express a ratio as a fraction • To divide amounts into given ratios • To complete calculations from a given ratio and partial information
				5.2 Direct proportion problems		• To recognise and solve problems using direct proportion
				5.3 Best buys		• To find the cost per unit weight and the weight per unit cost • To use the unitary method to identify the cheapest option
				5.4 Compound measures		• To solve problems involving speed/distance/time and density/mass/volume

				5.5 Compound interest and repeated percentage change		• To calculate simple and compound interest • To solve problems involving repeated percentage change
				5.6 Reverse percentages (working out the original quantity)		• To find percentage increases and reductions • To solve prolems that require the removal of a percentage interest by reducing the price by a different amount (reverse percentages)
		11/12	6 Geometry and measures: Angles	6.1 Angle facts	5	• To know the sum of the angles on a straight line, around a point, in a triangle and in a quadrilateral
				6.2Triangles		• To solve missing angle problems in triangles
				6.3 Angles in a polygon		• To work out the sum of the interior angles in a polygon
				6.4 Regular polygons		• To be able to calculate the size of the interior and exterior angles of any regular polygon
				6.5 Parallel lines		• To solve problems involving alternate, corresponding, allied and opposite angles
				6.6 Special quadrilaterals		• To be able to calculate the size of angles in special quadrilaterals using their geometric properties

				6.7 Scale drawings and bearings		• To be able to make a scale drawing to a given scale • To be able to convert measurements to calculate actual distances • To be able to read, interpret and draw bearings diagrams • To use the geometrical properties of a diagram to calculate a bearing
		12	End of term assessment		1	
		12	*Assessment review*		1	
		CHRISTMAS HOLIDAY				
	Term 2	1	7 Geometry and measures: Transformations, constructions and loci	7.1 Congruent triangles	4	• To identify two congruent triangles • To justify why two triangles are congruent
				7.2 Rotational symmetry		• To identify and describe the rotational symmetry of a shape
				7.3 Transformations		• To translate a 2D shape, using vectors to describe the transformation • To draw and describe the image of one or more reflections • To draw and describe a rotation that will take an object onto its image • To enlarge a 2D shape by a positive or negative integer or fraction scale factor and describe the transformation
				7.4 Combinations of transformations		• To combine transformations • To describe a sequence of transformations to map an object onto its image
				7.5 Bisectors		• To construct the bisectors of lines and angles
				7.6 Defining a locus		• To draw a locus for a given rule

				7.7 Loci problems		• To solve loci problems in practical contexts
				7.8 Plans and elevations		• To draw 2D representations of 3D objects from different views
		2/3	1:8 Algebra: Algebraic manipulation	8.1 Basic algebra	7	• To recognise expressions, equations, formulae and indentities • To substitute into, manipulate and simplify algebraic expressions
				8.2 Factorisation		• To factorise an algebraic expression
				8.3 Quadratic expansion		• To multiply out a pair of algebraic brackets such as $(x + a)(x – b)$
				8.4 Expanding squares		• To multiply out a pair of identical brackets such as $(x + a)(x + a) = (x + a)^2$
				8.5 More than two binomials		• To multiply out a string of algebraic brackets such as $(x + a)(x – b)(x + c)$
				8.6 Quadratic factorisation		• To factorise quadratic expressions with the coefficient of x^2 equal to 1
				8.7 Factorising $ax^2 + bx + c$		• To factorise quadratic expressions with the coefficient of x^2 not equal to 1
				8.8 Changing the subject of a formula		• Be able to rearrange formulae
		4/5	9 Geometry and measures: Length, area and volume	9.1 Circumference and area of a circle	7	• To calculate the circumference and area of a circle
				9.2 Area of a parallelogram 9.3 Area of a trapezium		• To find the area of a parallelogram and a trapezium
				9.4 Sectors		• To calculate the length of an arc and the area of a sector
				9.5 Volume of a prism		• To calculate the volume of a prism
				9.6 Cylinders		• To calculate the volume and surface area of a cylinder

				9.7 Volume of a pyramid		• To calculate the volume of a pyramid
				9.8 Cones		• To calculate the volume and surface area of a cone
				9.9 Spheres		• To calculate the volume and surface area of a sphere
			Half term assessment		1	
			HALF TERM			
		6/7	10 Algebra: Linear Graphs	10.1 Drawing linear graphs from points	7	• To draw a line graphs using three points (x, y)
				10.2 Gradient of a line		• To work out the gradient of a straight line • To know that the gradient of a line is the coefficient of x (m) in $y = mx + c$, the general equation for a straight line.
				10.3 Drawing graphs by gradient-intercept and cover-up methods		• To draw graphs using the gradient / intercept method
				10.4 Finding the equation of a line from its graph		• To find the equation of a line, given its gradient and y-axis intercept
				10.5 Real-life uses of graphs		• To solve problems in practical contexts using graphs
				10.6 Solving simultaneous equations using graphs		• To use the graphical intercept method of solving simultaneous equations
				10.7 Parallel and perpendicular lines		• To know that parallel lines have the same gradient • To know that the product of the gradients of perpendicular lines is always -1
		8/9/10	11Geometry and measures: Right-angled triangles	11.1 Pythagoras' theorem	9	• To calulate the length of the hypotenuse in a right-angled triangle
				11.2 Finding the length of a shorter side		• To calculate the length of a shorter side in a right-angled triangle

				11.3 Applying Pythagoras' theorem in real-life situations		• To solve real-life problems involving Pythagoras' theorem
				11.4 Pythagoras' theorem and isosceles triangles		• To use the geometry of isosceles triangles and Pythagoras' theorem to solve angle problems
				11.5 Pythagoras' theorem in three dimensions		• To use Pythagoras' theorem in problems involving three dimensions
				11.6 Trigonometric ratios		• To use the three trigonometric ratios
				11.7 Calculating angles		• To use the trigonometric ratios to calculate an angle
				11.8 Using the sine and cosine functions		• To find the lengths of sides and sizes of angles in right-angled triangles using the sine and cosine functions
				11.9 Using the tangent function		• To find the lengths of sides and sizes of angles in right-angled triangles using the tangent function
				11.10 Which ratio to use		• To use 'SOHCAHTOA' to decide which ratio to use
				11.11 Solving problems using trigonometry		• To solve practical problems involving trigonometry, including those with angles of elevation and depression
				11.12 Trigonometry and bearings		• To solve bearings problems using trigonometry
				11.13 Trigonometry and isosceles triangles		• To use trigonometry to solve problems involving isosceles triangles
		10	12 Geometry and measures: Similarity	12.1 Similar triangles	3	• To show that two triangles are similar • To work out the scale factor between similar triangles
				12.2 Areas and volumes of similar shapes		• To solve problems involving the area and volume of similar shapes
			End of term assessment		1	
			Assessment review		1	
		EASTER HOLIDAY				

	Term3	1/2	13 Probability: Exploring and applying probability	13.1 Experimental probability	7	• To calculate experimental probabilities and relative frequencies • To estimate probabilities from experiments • To use different methods to estimate probabilities
				13.2 Mutually exclusive and exhaustive events		• To recognise mutually exclusive, complementary and exhaustive events
				13.3 Expectation		• To predict the likely number of successful events, given the number of trials and the probability of any one event
				13.4 Probability and two-way tables		• To read two-way tables and use them to work out probabilities and interpret data
				13.5 Probability and Venn diagrams		• To construct and read Venn diagrams to represent probability
		3	14 Number: Powers and standard form	14.1 Powers (indices)	4	• To use powers of numbers to describe large and small numbers and generate number patterns
				14.2 Rules for multiplying and dividing powers		• To use the laws of indices to calculate or simplify algebraic expressions
				14.3 Standard form		• To convert an ordinary number into standard form and vice versa • To calculate using numbers in standard form, applying the laws of indices
		4/5/6	15 Algebra: Equations and inequalities	15.1 Linear equations	11	• To solve linear equations
				15.2 Elimination method for simultaneous equations		• To use the elimination method to solve simultaneous equations
				15.3 Substitution method for simultaneous equations		• To use the substitution method to solve simultaneous equations

				15.4 Balancing coefficients to solve simultaneous equations		• To use the method of balancing coefficients to solve simultaneous equations
				15.5 Using simultaneous equations to solve problems		• To solve problems, using simultaneous linear equations with two variables • To solve problems using linear and non-linear simultaneous equations
				15.6 Linear inequalities 15.7 Graphical inequalities		• To solve a simple linear inequality • To show a graphical inequality • To know how to find regions that satisfy more than one graphical inequality
				15.8 Trial and improvement		• To estimate the solution to an equation that does not have an exact solution, using the method of trial and improvement
			Half term assessment		1	
			HALF TERM			
		7/8	16 Number: Counting, accuracy, powers and surds	16.2 Estimating powers and roots	7	• To use known facts and trial and improvement to estimate the value of powers and roots
				16.3 Negative and fractional powers		• To represent roots and decimal numbers as indices
				16.1 Rational numbers, reciprocals, terminating and recurring decimals		• To recognise rational numbers, reciprocals,terminating and recurring decimals • To convert terminal decimals to fractions • To convert fractions to recurring decimals • To find reciprocals of integers or fractions

				16.4 Surds		• To simplify surds • To calculate with and manipulate surds, including rationalising a denominator
				16.5 Limits of accuracy		• To find the limits of accuracy of numbers that have been rounded to different degrees of accuracy • To identify the upper and lower bounds of an estimation
				16.6 Problems involving limits of accuracy		• Combine limits of two or more variables together to solve problems
				16.7 Choices and outcomes		• To work out the number of choices, arrangements or outcomes when choosing from lists or sets
		9/10	17 Algebra: Quadratic equations	17.1 Plotting quadratic graphs	7	• To plot quadratic graphs using a table of values
				17.2 Solving quadratic equations by factorisation		• To solve a quadratic equation by factorisation (by sight)
				17.3 Solving a quadratic equation by using the quadratic formula		• To use the quadratic formula to solve a quadratic equation where factorisation is not possible • To derive the quadratic formula by completing the square for $ax^2 + bx + c = 0$ (extension)
				17.4 Solving quadratic equations by completing the square		• To solve quadratic equations by completing the square

				17.5 The significant points of a quadratic curve		• To identify and interpret roots, intercepts and turning points of quadratic functions graphically • To deduce roots algebraically and turning points by completing the square • To use this information to sketch the curve
				17.6 Solving equations, one linear and one non-linear usinggraphs		• To solve a pair of simultaneous equations where one is linear and one is non-linear, using graphs and where they intersect
				17.7 Solving quadratic equations by the method of intersection		• To solve quadratic equations using intersection points between graphs or at axes
				17.8 Solving linear and non-linear simultaneous equations algebraically		• To use algebraic techniques, including substitution and rearranging, to solve a pair of equations
				17.9 Quadratic inequalities		• To solve a quadratic inequality algebraically • To show a graphical quadratic inequality • To know how to find regions that satisfy more than one graphical inequality
		11/12	18 Statistics: Sampling and more complex diagrams	18.1 Collecting data	7	• To know the range of methods of sampling and decide which method is best when collecting reliable, unbiased data

				18.2 Frequency polygons		• To draw frequency polygons for discrete and continuous data • To draw histograms for continuous data with equal intervals • To construct pie charts
				18.3 Cumulative frequency graphs		• To find a measure of dispersion (the interquartile range) and a measure of location (the median) using a graph
				18.4 Box plots		• To draw and read box plots
				18.5 Histograms		• To draw and read histograms where the bars are of unequal width • To find the median, quartiles and interquartile range from a histogram
			End of term assessment		1	
			Assessment review		1	
		END OF YEAR 10 / SUMMER HOLIDAY				
Year 11	Term 1	1/2	19 Probability: Combined events	19.1 Addition rules for outcomes of events	7	• To work out the probability of two events such as P(A) or P(B)
				19.2 Combined events		• To work out the probability of two events occurring at the same time
				19.3 Tree diagrams		• To use and construct sample space diagrams and tree diagrams to work out the probability of combined events
				19.4 Independent events		• To calculate using the 'and' and the 'or' rule to find the probality of combined events
				19.5 Conditional probability		• To work out the probability of combined events when the probabilities change after each event
		3 /4	20 Geometry and measures: Properties of circles	20.1 Circle theorems	7	• To use circle theorems to find the size of angles in circles

				20.2 Cyclic quadrilaterals		• To find the size of angles in cyclic quadrilaterals
				20.3 Tangents and chords		• To use tangents and chords to find the size of angles in circles
				20.4 Alternate segment theorem		• To use the alternate segment theorem to find the size of angles in circles
		5/6	21 Ratio, proportion and rates of change: Variation	21.1 Direct proportion	7	• To solve problems where two variables have a directly proportional relationship (direct variation) • To work out the constant and equation of proportionality
				21.2 Inverse proportion		• To solve problems where two variables have an inversely proportional relationship (inverse variation) • To work out the constant and equation of proportionality
			Half term assessment		1	
			HALF TERM			
		7/8	22 Geometry and measures: Triangles	22.1 Further 2D problems	7	• To use Pythagoras' theorem and trigonometric ratios to solve more complex two-dimensional problems
				22.2 Further 3D problems		• To use Pythagoras' theorem and trigonometric ratios to solve more complex three-dimensional problems
				22.3 Trigonometric ratios of angles between 0° and 360°		• To find the sine, cosine and tangent of any angle between 0° and 360° • To use the symmetry of the circular function graphs to find trigonmetric values
				22.3 Solving any triangle		• To use the sine rule and the cosine rule to find sides and angles in non-right-angled triangles

				22.4 Using sine to calculate the area of a triangle		• To use the sine rule to work out the area of any triangle, given two sides and the included angle
		9/10	23 Algebra: Graphs	23.1 Distance–time graphs	7	• To draw and interpret distance–time graphs • To know that the gradient represents the speed of the object
				23.2 Velocity–time graphs		• To draw and interpret velocity–time graphs • To know that the gradient represents the acceleration of the object • To know that the area under the graph represents the distance travelled
				23.3 Estimating the area under a curve		• To estimate the area under a curve by using rectangular strips
				23.4 Rates of change		• To interpret the gradient at a point on a curve as the instantaneous rate of change • To apply the concept of rates of change in numerical, algebraic and graphical contexts
				23.5 Equation of a circle		• To recognise and plot the equation of a circle • To use this equation to identify the centre and radius of the circle • To find the equation of a tangent to a circle at a given point
				23.6 Other graphs		• To recognise and plot cubic, exponential and reciprocal graphs

				23.7 Transformations of the graph $y = f(x)$		• To sketch translations and reflections of the graph of a given function • To be able to transform graphs and identify the effect of transformations on functions such as $y = 2f(x)$; $y = f(2x)$; $y = f(x) + 2$ and $y = f(x + 2)$
		11	Revision for Mock Exam		4	
		12	*MOCK EXAM*		2	
		12	*Mock exam review*		1	
	Term 2	12	*Algebra recap – graphs*		1	
			CHRISTMAS HOLIDAY			
		1/2	24 Algebra: Algebraic fractions and functions	24.1 Algebraic fractions	7	• To simplify algebraic fractions • To solve equations containing algebraic fractions
				24.2 Changing the subject of a formula		• To change the subject of a formula where the subject occurs more than once
				24.3 Functions		• To interpret simple expressions as functions with inputs and outputs • To interpret the reverse process as the inverse function • To use function notation to draw graphs and identify values by substitution
				24.4 Composite functions		• To interpret the succession of two functions as a composite function and be able to find output values from given input values

				24.5 Iteration		• To find approximate solutions to equations numerically using iteration • To set up, solve and interpret the answers in growth and decay problems, including compound interest, working with general iterative processes
		3	25 Geometry and measures: Vector geometry	25.1 Properties of vectors	4	• To add and subtract vectors • To multiply vectors by a scalar • To represent a vector in diagrammatic and column form
				25.2 Vectors in geometry		• To use vectors to solve geometric problems • To use vectors to construct geometric arguments and proofs
			The following topics are revisited to allow the most able to explore in greater depth			•
		4/5	22 Trigonometry	22.4 Sine rule	7	• Know and apply the sine rule to find unknown lengths and angles
				22.4 Cosine rule		• Know and apply the cosine rule to find unknown lengths and angles
				22.5 Area of a triangle using sine		• Know and apply area = $1/2ab\sin C$ to calculate the area, sides or angles of any triangle
			Half term review/ assessment		1	
			HALF TERM			

		6	23 Rates of change	23.4 Gradients	4	• Interpret the gradient at a point on a curve as the instantaneous rate of change • Interpret the gradients of tangents and chords in numerical, algebraic and graphical contexts
		7/8	20 Geometric proof and reasoning	20.1 Circle theorems	7	• Apply and prove the standard circle theorems concerning angles, radii, tangents and chords, and use them to prove related results
				25.2 Vectors		• Use vectors to construct geometric arguments and proofs
				7.4 Transformations		• Describe the changes and invariance achieved by combinations of rotations, reflections and transformations
		9/10	8 Algebraic proof and reasoning	8.1 Identities	7	• Know the difference between an equation and an identity • Argue mathematically to show algebraic expressions are equivalent • Use algebra to support and construct arguments and proofs
			EASTER HOLIDAY			
		1 /2	*Number recap*		7	
		3 /4	*Algebra recap*		7	
		5 /6	*Geometry recap*		7	
			HALF TERM			
		7 /8	*Statistics and probability recap*		7	
		9/10	*Revision and exam preparation*		7	
			GCSE MATHEMATICS EXAM (TBC)			